



INDUSTRIAL PHYSIOTHERAPY

By
EMILE C. DUVAL, M. D.
CHICAGO, ILLINOIS



Reprinted from
PHYSIOTHERAPEUTIC LECTURES
SECOND EDITION

Published by the
Educational Department of
H. G. FISCHER & CO., Inc.
2339 Wabansia Avenue
CHICAGO, ILLINOIS

THIS paper is one of a series reprinted from the volume of Physiotherapeutic Lectures, Second Edition, which contains complete reports of the Lectures, Clinics and Discussions of the Third Annual Physiotherapeutic Convention, held at Logan Square Masonic Temple, Chicago, October 20 to 24, 1924. The complete book, comprising 744 pages of text and many illustrations, may be secured from the Educational Department of H. G. Fischer & Company. The subscription price is \$9.00.

Copyright, 1925
H. G. Fischer & Company, Inc.

Industrial Physiotherapy

By Emile C. DuVal, M. D.

The after-treatment of industrial surgical cases affords a large field for the use of physiotherapy. There is no question as to the earlier termination of disability where proper physiotherapeutic measures have been used.

We have at our command today various appliances and modalities, which, when properly used, are very efficacious in helping to shorten the period of disability, and among these we have diathermy, negative galvanism, the faradic current, heliotherapy, hydrotherapy, and, of course, massage and manipulations. **Modalities Available**

Success in this, as in any other branch of medicine, depends, first of all, on the proper diagnosis, the knowledge of the pathology existing, and then the modality indicated, and the proper application of that modality.

There are a great number of the human ailments that are more or less amenable to physiotherapy, and I might enumerate here a few that we find frequently in the treatment of industrial cases. The sequelae of infectious processes (in the industrial world, mostly in the hand and arm), synovitis, bursitis, sacroiliac conditions, terminal nerve injuries, after-treatment of fracture cases, neuritis (traumatic) and many other conditions, are all more or less successfully treated by physiotherapy. **Cases Suitable**

There are no hard and fast rules in this form of treatment, any more than there are in other forms of treatment, and as every case is a law unto itself, you will by experience evolve methods in the application of modalities of which we know little today. We are constantly hearing from physicians who have improved upon some modality and its mode of application.

In the application of diathermy, we use a number of different electrodes, the metal electrodes consisting, some of them, of tin, and others sheet lead, and the mesh electrode. **Diathermy Treatment**

In articular and peri-articular conditions, we use an electrode of block tin, wrapped in cotton, which is held onto the tin by an ordinary bandage. This electrode is soaked in a normal salt solution and then applied. In the treatment of a knee case, for instance, a small electrode of this type measuring approximately four square inches, is placed on each side of the joint, and the current gradually increased to the point where your meter shows a reading of 800 milliamperes. If the case to be treated (we are still referring to knee cases) shows indications of strong adhesions and fibrous formation, a larger electrode of the same type is used, one electrode being placed at least three inches above the knee joint on the anterior surface of the limb, and the other on the posterior surface, and about three inches below the popliteal space.

Bursitis Cases of bursitis are best treated with the dry block tin electrodes. We have had a number of sub-deltoid cases recently that responded to diathermy when other therapeutic measures failed.

After treatment in cases of fractures of the shaft of long bones, when diathermy is indicated, the cuff method of applying the electrodes is favored by many physiotherapists.

The time necessary for successful treatment with diathermy is approximately one hour, and the amount of current to be used is entirely dependent on the size of the area to be treated.

Colles' Fracture DR. G. H. ROTHWITT (Liberty, Mo.): I have a case now of a Colles' fracture that was very close to the end of the bone. It was cared for by another physician, in another community, and was kept on a straight splint for five or six weeks. Now the wrist is almost ankylosed. The thumb and finger are ankylosed. By diathermy and manipulation I have gotten considerable movement, but it comes mighty slow.

DR. DUVAL: Of course a good deal depends on the age of the patient.

DR. ROTHWITT: He is fifty or more.

DR. DUVAL: The adult of that age does not respond to treatment as readily as a younger person. In this case the period of immobilization was in my opinion rather long, and consequently the return of function will require a correspondingly long time. But the fact that the fracture was so near the joint perhaps had something to do with the long immobilization, and I would say that I have found the radiocarpal articulation rather hard to loosen up in some individuals. However, persistent treatment is indicated in such cases and if the X-ray shows that there is no fusing of the articular surfaces of the bones involved, a fairly good result can be attained.

DR. ROTHWITT: How would you apply the electrodes in this case? **Application of Electrodes**

DR. DUVAL: I would use the wet electrodes, one in the palm of the hand, the other on the dorsal surface of the forearm, about three inches proximal to the radiocarpal articulation.

DR. ROTHWITT: The fingers are ankylosed.

DR. DUVAL: You mean, of course, a pseudo ankylosis, and you want to know how the heat can be brought into the fingers.

DR. ROTHWITT: Yes.

DR. DUVAL: A wet electrode consisting of the cotton on a pliable piece of block tin can very easily be applied to the middle and distal phalanges on the palmar surface in such a manner that you can get all the heat that is necessary.

DR. C. O. LINDER (Spokane, Wash.): Is it not possible to get a diathermic burn from prolongation of the treatment? **Diathermic Burns**

DR. DUVAL: Yes, that is quite possible, but in conjunction with the length of time, the current would have to be concentrated to such an extent that your patient would soon notify you of the uncomfortable heat, unless of course,

the patient had also an anesthesia in the area treated. Let me say a little more about this. You understand that the current can be concentrated at one point so that a coagulation of the tissue is brought about, such as in surgical diathermy. Now, then, the larger the electrode the more diffused is the heat, and consequently the more milliamperes are necessary to heat the part, so you see the burn could occur if a large number of milliamperes are used to heat a small area.

DR. LINDER: I have noticed several doctors in my locality who produced quite a number of diathermic burns, and I imagine it was from the fact that the pad got dry and burned through.

DR. DUVAL: The only burns that I have seen brought about by diathermy were caused by the faulty application of the electrode on the part that was burned. The contact of the electrode with the skin was not good, and thus allowed a sparking between the electrode and the skin. I believe that I have used nearly all of the apparatus now in use for treatment by diathermy, and while some are much better than others, I have yet to find one that would burn when properly applied.

Neuritis DR. J. O. HARRELL (Orlando, Fla.): Will you give us your treatment for neuritis?

DR. DUVAL: As a rule I do not use diathermy in the treatment of neuritis. I use the plain galvanic current as produced by the Morse machine. Dr. Morse, if I quote him correctly, suggests placing the positive pole on the painful part and the negative on the other end of the nerve. That method I have tried but have had no beneficial result. The best results that we have had were attained by placing the negative pole over the root of the nerve, and the positive on its terminal end. In treating sciatica, good results will be had if the negative pole is placed on the sacroiliac synchondrosis of the affected side, and the positive pole on the distal end of the anterior tibial nerve.

CHAIRMAN HENRY: Those of you who are interested in industrial surgery will make a great mistake if you don't have Tinel at your elbow. He made the most wonderful collection of injuries to joints and nerves during the war, and it is one of the books that you ought to have. If you want to know what has taken place in a nerve when it is injured, when it has been infected, when it won't carry the nerve current, you must have Tinel.



Diathermy treatment of injured hand

The Economic Value of Physiotherapy

By Emile C. DuVal, M. D.

It is pretty hard to estimate the value of physiotherapy in industrial cases. Some years ago, industrial cases were left to their own method of treatment when they were the subject of injury. The advent of the Compensation Act in this state and various other states has made it incumbent upon the employer of the injured man to furnish him with the necessary treatment until such time as he is in position to resume as nearly as possible the work that he did before. Physiotherapy in industrial cases has come into its own since the advent of the Compensation Act.

Physiotherapy
In Industrial
Cases

Of course, to be successful in treating industrial cases, and incidentally your own private cases, it is necessary to understand fully the pathology existing and to understand thoroughly the modalities to be used and the way they are to be applied. Doctors have come to me from time to time and have said, "You have had results of so and so in such and such a case. How did you get them? I have had similar cases and have had no result." The doctor understood his pathology, he knew what was existing there, but the faulty application of the modality that he was using was the cause of his non-success. Nobody expects anything miraculous of physiotherapy, but we do know beyond the possible shadow of a doubt that we can attain certain things that we cannot by medicine or surgery; we can attain these things by physiotherapy.

A better way, perhaps, to illustrate the economic value of physiotherapy is to cite a case or two. About three years ago I was called to examine a case by the General Accident Company. This man had had a staphylococcic infection in his hand. The infection had been overcome and the sequela usually attendant upon such a condition was existing here. Later, it transpired that a very eminent physician who has written considerable literature on surgery examined this man's hand for the insurance company and

Infection
of the Hand

he told them that at that particular time the man's hand was absolutely useless, that perhaps in a period of two years he might attain ten per cent functioning of the hand.

Symptoms

I happened to be in this Company's office examining another case and they referred this case to me for examination, to see if anything could be done to restore at least some function to the man's hand. There was no swelling any more in the hand, but the fingers were in absolute full extension, close together, the thumb adducted to the palm of the hand. There was no movement voluntarily at all in those joints of the fingers. There was a little movement of passive motion at the metacarpophalangeal articulation.

I had had experience with a case somewhat similar to this a short time before and had obtained a fair result. I informed the man who turned over the case to me for examination that I thought perhaps I could eventually give this man fifty per cent use of his hand. He said, "You take the case and treat it." At this time I had not heard anything about the report of the physician who had examined the case before.

Diathermy Treatment

We gave this man diathermy every day, followed by manipulations for a period of about three months. At the end of three months this man closed his hand down voluntarily so the tips or the ball of the fingers came down on the palm of the hand in this fashion. I discharged the man, telling him that active use of the hand would restore full function quicker than treatment might. Instead of the insurance company paying him for the full loss of the use of the hand, the man returned to his work and came back to me again in three months after that with full function of the hand.

There are a number of cases that I could cite to you similar to that, and these cases can be verified. An insurance company must know the facts because they are paying for any deformity or any limitation of function that exists after you get through with the case.

There is one thing that I would like to impress upon you. If a case does not respond to treatment in the first two or three weeks, do not be discouraged. We are handling at our office at this time perhaps twenty-five cases a day in physiotherapeutic measures. The majority of these cases, where the injury has been somewhat serious or where there has been a deep-seated infection, and again on conditions where there is a bursitis, synovitis of the knee or bursitis of the elbow, take perhaps from a week to ten days to begin to respond to treatment.

After that period of time they begin to respond very quickly, in fact to such an extent that you would be agreeably surprised.

Another instance which I will speak of is one of an ununited fracture. I have reference again to the economic value of physiotherapy. It was a case of a fracture of the tibia at the juncture of the middle and lower third. It was referred to me by another insurance company. This fracture had existed ununited for a period of five months when I saw the man. That man had six weeks' treatment daily with diathermy and I got a solid union of that bone. In six weeks after that the man returned to work in a road construction gang; his leg was healed by that time.

Ununited Fracture

The man was referred to me originally by an insurance company at the behest of their chief surgeon, who is also an eminent surgeon in this city. That particular man himself sometime ago came down to my office for a treatment. He came into my office one day with what he termed lumbago. I said, "There is no such thing as lumbago. You have a sore back. We will fix it for you."

"Lumbago"

We put him on the table and treated him. He left the office very much relieved. He said, "I am a believer from now on in this physiotherapy stuff. I think it is something mighty good."

The insurance companies are pretty hard headed people as a rule. Every dealing they have, of course, is a matter

of dollars and cents to them. A number of these companies have established physiotherapy departments in their local offices. They have tried this thing and they have found it to be a very useful form of treatment.

Ankylosis
of Joint

Say, for instance, we had a fracture of a bone in close proximity to a joint. The immobilization of the part to insure union of that bone naturally brought about more or less of a pseudo ankylosis in that joint. Before physiotherapy was brought into play that patient was allowed to go and do the best he could. The surgeon couldn't do anything for him. "Go and exercise your leg and do the best you can," he told the patient. The result was that if he was a poor man he became perhaps a charge on the community for a certain period of time and if the condition was one that might develop into a permanent disability, he might be incapacitated to a great extent for the rest of his life.

Period of
Disability
Shortened

By the use of physiotherapy, function is returned, I will say, without exaggeration, in from one-third to one-half of the time that it would be without the use of physiotherapy. The records of the insurance companies today where you have had fracture, bursitis, synovitis, nerve involvement, in fact any kind of traumatic injury of any consequence, will show that where physiotherapy has been used the period of disability has been very materially shortened.

Certain surgeons in various parts of the United States have said that physiotherapy was of no use in certain conditions, for instance fractures of the long bones; that when the bone was healed if there was no involvement of the joint, nature would restore the part and function as quickly as physiotherapy would. Can you imagine a part, even if you have a fracture of the long bone, say it is a comminuted fracture where you have a lot of induration in the soft tissues and impaired circulation, being restored by nature after immobilization as quickly as if that part were manipulated and heated and nature were helped to a great extent by artificial means?

I believe that physiotherapy today is one of the greatest things that we have, one of the greatest branches of medicine. I have had a great deal of experience with it and I feel that the doctor who overlooks what he can do by physiotherapy some day is going to be a back number.

Some time ago I had the opportunity to try diathermy on a gall bladder case. I didn't make the diagnosis; it was made by another physician. The case was referred to me then and I said, "We will try diathermy on it." This man, after one application, while he was still in the office, told me he was relieved from pain, the nausea that was attendant upon his condition was partly relieved. The man was more or less subject to chronic constipation and the following morning he came back to see me again and told me the bowels had moved rather freely. That man had four applications of diathermy on four successive days and he had no return whatsoever of the condition that existed when he first came to me.

Gall
Bladder
Case

CHAIRMAN HENRY: Our last speaker said that physiotherapy had come to stay. I know you men are asking yourselves the question, "Where in the world am I going to get any systematic training or education along this new field?" You will be interested to know that the Medical Department of Harvard University has put in a course; that in the Post Graduate School at the University of Pennsylvania they have put in a course of this kind, and over the country they are holding clinics of from one to three days where you men can leave your work and go and just pick up a few things each time. You will have to begin in a small way and branch out into this new field. If that is true, it would be logical to expect that organizations where we can get together once or twice a year are going to be formed, and such an organization has been formed of just regular doctors now who belong to their county and their state societies, based on the regulation plans of the A. M. A. Such an organization I say has been formed and I want you men to know about it.

I see Dr. Tyler here in the audience and I am going to ask him to just tell you the name of the organization and how you can get in touch with it. If you care to join such an association just the same as you would your county society, you will be very gladly welcomed.

DR. ALBERT F. TYLER: I have been asked by the Chairman to make an announcement about the American College of Radiology and Physiotherapy. This is an organization originally organized by a group of physicians who were interested in this particular class of work, and it is now having its third annual meeting at the Hotel Sherman, Chicago, November 12-14. As Dr. Henry said, the requirements for membership are the same as in the A. M. A. Any one belonging to his county medical society and interested in physiotherapeutic methods or X-ray or radium or all of these things can be a member of the society. The annual dues are ten dollars, which includes subscription to the official publication.

The purposes of the College are high, and are planned a great deal like the College of Surgeons. All of you are invited to join.

Treatises on Electro-Physiotherapy

A comprehensive series of treatises covering the uses of Electro-Physiotherapy has recently been published by H. G. Fischer & Company. Among these treatises, all of which have been especially prepared for this series, are the following:

- Principles of Surgical Diathermy. Gustav Kolischer, M. D., Chicago, Ill.
- Electro-coagulation, Its Place in Surgery. By T. Howard Plank, M. D., Chicago, Ill.
- Diathermy in Gynecology. By W. B. Chapman, M. D., Carthage, Mo.
- Treatment of Accessible Malignancies. By J. U. Giesy, M. D., Salt Lake City, Utah.
- Surgical Diathermy in Benign Skin Blemishes. By Albert F. Tyler, M. D., Omaha, Neb.
- Electro-coagulation of Tonsils. By Harry M. Thometz, M. D., Chicago, Ill.
- Renal Disease. By Curran Pope, M. D., Louisville, Ky.
- The Treatment of Tuberculosis by Physical Agents. By W. B. Chapman, M. D., Carthage, Mo.
- Chronic Gonorrhea and Its Complications. By Carlton L. Rowell, M. D., Chicago, Ill.
- Electro-coagulation of Hemorrhoids. By J. B. H. Waring, M. D., Blanchester, Ohio.
- Diathermy in Faulty Hearing. By E. G. Linn, M. D., Des Moines, Iowa.
- Diathermy in Pulmonary Tuberculosis. By Dean W. Harman, M. D., Ames, Iowa.
- Ultra-violet Energy and Its Use in Medicine. By Leo C. Donnelly, M. D., Detroit, Mich.

These treatises are distributed without charge to physicians and surgeons. If additional information concerning any subject in the series is desired, it may be secured promptly by addressing the Educational Department of H. G. Fischer & Company, Inc.